

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
11 August 2005 (11.08.2005)

PCT

(10) International Publication Number
WO 2005/072392 A3

(51) International Patent Classification⁷: C12N 15/66, (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(21) International Application Number:
PCT/US2005/002633

(22) International Filing Date: 28 January 2005 (28.01.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/539,774 28 January 2004 (28.01.2004) US
60/557,152 26 March 2004 (26.03.2004) US
60/607,684 7 September 2004 (07.09.2004) US
60/628,997 18 November 2004 (18.11.2004) US

(71) Applicant (for all designated States except US): JOHN HOPKINS UNIVERSITY [US/—]; 3400 North Charles Street, Baltimore, MD 21218 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): OSTERMEIER, Marc, Alan [US/US]; 6916 Bellona Avenue, Baltimore, MD 21212-1108 (US). GUNTAS, Gurkan [TR/US]; 6230 Green Meadow Parkway, Baltimore, MD 21209 (US).

(74) Agent: CORLESS, Peter, F.; Edwards & Angell, LLP, P.O. Box 55874, Boston, MA 02205 (US).

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SI, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
5 January 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2005/072392 A3

(54) Title: METHODS FOR MAKING AND USING MOLECULAR SWITCHES INVOLVING CIRCULAR PERMUTATION

(57) Abstract: The invention provides molecular switches which couple external signals to functionality, and combinatorial methods of making and using the same involving circular permutation of nucleic acid and amino acid sequences. The switches according to the invention can be used, for example, to regulate gene transcription, target drug delivery to specific cells, transport drugs intracellularly, control drug release, provide conditionally active proteins, perform metabolic engineering, and modulate cell signaling pathways. Libraries comprising the switches, expression vectors and host cells for expressing the switches are also provided.